

Notice of Allowability

Application No.

09/742,576

Applicant(s)

EIHO ET AL.

Examiner

Art Unit

Nelson D. Hernandez

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-35.
3. ☒ The drawings filed on 20 December 2000 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 2/28/2005
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Amendment

1. Examiner acknowledges the amendments made on the claims, filed on February 28, 2005.

Response to Arguments

2. Applicant's arguments, see pages 14 to 15, filed on February 28, 2005, with respect to claims **6** and **19** have been fully considered and are persuasive. The rejection of claims **6** and **19** has been withdrawn.

Allowable Subject Matter

3. Claims **1-35** are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter:

Regarding **claims 1, 6, 8, 14, 15, 19, 21 and 27**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest that the degree of the sharpening process is controlled by altering according to image data subjected to the sharpening process, a first parameter for determining the size of the second-order differential to be subtracted from the image data of the original image.

Jain, "Fundamentals of Image Processing" (1989), discloses an image-processing method, which carries out a unsharpening process by adding to the image data of the original image the second-order differential (See equation 9.20, page 351) with respect to each pixel, the second order differential being obtained by 1) defining the distribution of image data of an original image as a function, and 2) taking the Laplacian

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of that function, wherein the degree of the unsharpening process is controlled by altering a first parameter " λ " (See equation 7.31, page 249) for determining the size of the second-order differential to be added to the image data of the original image (Pages 248-249; pages 351-353). The process discussed by Jain is an unsharpening process and not a sharpening process but can be changed to a sharpening process by making the first parameter $\lambda < 0$. However Jain fails to teach or reasonably suggest that the degree of the sharpening process is controlled by altering according to image data subjected to the sharpening process, a first parameter for determining the size of the second-order differential to be subtracted from the image data of the original image.

Regarding **claim 3**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest that the data that is representative of the characteristic of the image data is an average value of the chrominance differential values of respective pixels contained in the image data.

Jain, "Fundamentals of Image Processing" (1989), discloses an image-processing method, which carries out a unsharpening process by adding to the image data of the original image the second-order differential (See equation 9.20, page 351) with respect to each pixel, the second order differential being obtained by 1) defining the distribution of image data of an original image as a function, and 2) taking the Laplacian of that function, wherein the degree of the unsharpening process is controlled by altering a first parameter " λ " (See equation 7.31, page 249) for determining the size of the second-order differential to be added to the image data of the original image (Pages 248-249; pages 351-353). The process discussed by Jain is an unsharpening process

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and not a sharpening process but can be changed to a sharpening process by making the first parameter $\lambda < 0$. However Jain fails to teach or reasonably suggest that the data that is representative of the characteristic of the image data is an average value of the chrominance differential values of respective pixels contained in the image data.

Regarding **claim 28**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest that in the Laplacian process, adjacent pixels whose pixel values are not different from that of the target value by more than a parameter θ are not subjected to the Laplacian process, and a resulting output value for $g(i, j)$ from the sharpening process is adjusted using the parameter θ which is a set variable.

Jain, "Fundamentals of Image Processing" (1989), discloses an image-processing method, wherein an unsharpening process is carried out based on the following equation: $v(m, n) = u(m, n) - \lambda g(m, n)$, (Formula 7.31, page 249), wherein $u(m, n)$ is a pixel value of a target pixel in an original image, $v(m, n)$ is a pixel value of the target pixel after carrying out the unsharpening process with respect to the original image, and $g(m, n)$ is a function commonly used as the Laplacian $\nabla^2 f(i, j)$ (See page 351, formula 9.20) is a function obtained by carrying out a Laplacian process based on the pixel value of the target pixel and pixel values of a plurality of pixels adjacent to the target pixel, and a resulting output value of $v(m, n)$ from the unsharpening process is adjusted by setting a value " λ " variable. The process discussed by Jain is an unsharpening process and not a sharpening process but can be changed to a sharpening process by making the first parameter $\lambda < 0$. However Jain fails to teach or

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reasonably suggest that in the Laplacian process, adjacent pixels whose pixel values are not different from that of the target value by more than a parameter θ are not subjected to the Laplacian process, and a resulting output value for $g(i, j)$ from the sharpening process is adjusted using the parameter θ which is a set variable.

Regarding **claim 29**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest that the function has at least one of an upper limit and a lower limit, said upper limit or said lower limit is a set variable, said upper limit or said lower limit which is a set variable is obtained by dividing a parameter a by a chrominance difference value between said target pixel and one of the pixels adjacent to said target pixel; and a resulting output value $g(i, j)$ from the sharpening process is adjusted using the parameter a which is a set variable.

Jain, "Fundamentals of Image Processing" (1989), discloses an image-processing method, wherein an unsharpening process is carried out based on the following equation: $v(m, n) = u(m, n) - \lambda g(m, n)$, (Formula 7.31, page 249), wherein $u(m, n)$ is a pixel value of a target pixel in an original image, $v(m, n)$ is a pixel value of the target pixel after carrying out the unsharpening process with respect to the original image, and $g(m, n)$ is a function commonly used as the Laplacian $\nabla^2 f(i, j)$ (See page 351, formula 9.20) is a function obtained by carrying out a Laplacian process based on the pixel value of the target pixel and pixel values of a plurality of pixels adjacent to the target pixel, and a resulting output value of $v(m, n)$ from the unsharpening process is adjusted by setting a value " λ " variable. The process discussed by Jain is an unsharpening process and not a sharpening process but can be changed to a

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sharpening process by making the first parameter $\lambda < 0$. However Jain fails to teach or reasonably suggest that the function has at least one of an upper limit and a lower limit, said upper limit or said lower limit is a set variable, said upper limit or said lower limit which is a set variable is obtained by dividing a parameter a by a chrominance difference value between said target pixel and one of the pixels adjacent to said target pixel; and a resulting output value $g(i, j)$ from the sharpening process is adjusted using the parameter a which is a set variable.

Regarding **claims 10, 23, 31 and 34**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest that the second-order differential has at least one of an upper limit and a lower limit, and the degree of the sharpening process is controlled by altering a third parameter for determining the upper limit and/or the lower limit. Jain also fails to teach or suggest that in the Laplacian process, adjacent pixels whose pixel values are not different from that of the target value by more than a parameter θ are not subjected to the Laplacian process, and a resulting output value for $g(i, j)$ from the sharpening process is adjusted using the parameter θ which is a set variable.

Jain, "Fundamentals of Image Processing" (1989), discloses an image-processing method, which carries out a unsharpening process by adding to the image data of the original image the second-order differential (See equation 9.20, page 351) with respect to each pixel, the second order differential being obtained by 1) defining the distribution of image data of an original image as a function, and 2) taking the Laplacian of that function, wherein the degree of the unsharpening process is controlled by

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altering a first parameter " λ " (See equation 7.31, page 249) for determining the size of the second-order differential to be added to the image data of the original image (Pages 248-249; pages 351-353). The process discussed by Jain is an unsharpening process and not a sharpening process but can be changed to a sharpening process by making the first parameter $\lambda < 0$. However, Jain fails to teach or suggest that the second-order differential has at least one of an upper limit and a lower limit, and the degree of the sharpening process is controlled by altering a third parameter for determining the upper limit and/or the lower limit. Jain also fails to teach or suggest that in the Laplacian process, adjacent pixels whose pixel values are not different from that of the target value by more than a parameter θ are not subjected to the Laplacian process, and a resulting output value for $g(i, j)$ from the sharpening process is adjusted using the parameter θ which is a set variable.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernandez whose telephone number is (571) 272-7311. The examiner can normally be reached on 8:30 A.M. to 6:00 P.M..


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R. Garber can be reached on (571) 272-7308. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nelson D. Hernandez
Examiner
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NDHH
March 16, 2005


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